

VENEER CUTTING AND DRYING PROPERTIES

RED ALDER

Red alder (*Alnus rubra*) is a small hardwood tree found commonly on the Pacific coast,^{1, 2} that has been used to a considerable extent in lumber form for the manufacture of medium-grade furniture. It has been made into veneer and plywood only on a very limited scale, probably because the tree rarely reaches a diameter of more than about 16 inches.

The wood of red alder is of uniform texture and its density is approximately the same as that of yellow-poplar. It does not have a pronounced grain pattern. The wood is white when first cut but it ages rapidly to a light reddish-brown color. It is relatively soft, the texture is uniform and close, and the grain is straight.

The species appears to be suitable for cutting into veneer on a limited scale. The wood forms a desirable base material for painting or enameling and could therefore be used as a face veneer on plywood for cabinets and other interior applications. When used as a face ply over softwood veneers it would provide a smooth painting surface relatively free from checking and grain raising for many interior applications. The wood also appears to have the requisite properties for a good crossband veneer for use in fine veneered furniture panels.

Description of Logs Studied

Laboratory tests were restricted to cutting and drying veneer from three 4-foot bolts. Pertinent data concerning the bolts are given in table 1.

Table 1.--Pertinent data on red alder veneer bolts tested

Characteristic	: Bolt No. 1 :	Bolt No. 2 :	Bolt No. 3
Diameter, small end.....inches:	12	: 11-1/2	: 12
Diameter, large end.....inches:	12	: 12	: 14-1/2
Eccentricity of pith.....inches:	1/2	: 1/2	: 1
Rings per inch, outside.....:	4	: 4	: 6
Rings per inch, near pith.....:	21	: 17	: 18
Total number of rings.....:	44	: 44	: 52
Moisture content.....percent:	89 to 105	: 91 to 115	: 71 to 96
Specific gravity.....:	0.38 to 0.44	: 0.40 to 0.42	: 0.40 to 0.44
External defects.....:	6 knots	: 6 knots,	: 16 protrusions
		: 1 open hole	: covering pin-
			: knot clusters

¹ Betts, H. S. Red Alder. American Wood Series. Forest Service, U. S. Department of Agriculture. 1945.

² Johnson, H. M., Hanzlick, E. J., and Gibbons, W. H. Red Alder of the Pacific Northwest, Its Utilization, with Notes on Growth and Management. U. S. Department of Agriculture Bulletin No. 1437. 1926.



Preparation of Logs for Cutting

Because the wood is relatively soft it is possible that good veneer could be cut from unheated bolts. At the Laboratory the bolts were heated in water at a temperature of 140° F. and the wood was found to be in excellent condition for cutting. To get adequate penetration of heat a 12-inch bolt four feet long should be heated at this moderate temperature for about 8 hours and a 16-inch bolt for 15 hours.

Heating alder bolts in steam would very probably result in overheating; veneer cut from such bolts would probably not cut smoothly and might split excessively from heating checks in the bolt ends.

Recommended Lathe Settings

A thorough study of various lathe settings³ at the Laboratory was not possible because of the limited amount of material cut. The settings given in table 2 were used to produce tight, smooth veneer.

Table 2.--Lathe settings used to cut tight smooth veneer of red alder

Veneer thickness	Knife angle	Horizontal : nosebar opening	Vertical : nosebar opening
Inch	Degrees-Minutes	Inch	Inch
1/32	90 - 30	0.025	0.010
1/24	90 - 20	.031	.012
1/16	90 - 10	.045	.016

Veneer Drying

The green veneer varied in moisture content from 71 to 105 percent. The veneer was dried in a mechanical roller-conveyor type dryer operating at a temperature of 250° F. In 5 minutes the 1/32- and 1/24-inch veneer dried to a moisture content of 2 to 3 percent, and in this condition it was rather brittle and split readily in handling. The 1/16-inch veneer was dried in 8 minutes to a moisture content of about 5 percent. The veneer dried flat and free of splits except in areas of distorted grain. The tangential (widthwise) shrinkage during drying, based on the green width, was about 7 percent.

Other Factors

The veneer cut at the Laboratory contained a considerable number of knots. It is possible that clear material could be obtained by better selection of veneer logs.

The wood can be glued satisfactorily if moderate care is used in the gluing operation.⁴ In lumber form the wood has been used extensively for cores in veneered panels.

³Fleischer, H. O. Experiments in Rotary Veneer Cutting. Proceedings, Forest Products Research Society. 1949.

⁴Truax, T. R. The Gluing of Wood. U. S. Dept. Agr. Bull. 1500. 1929.